

*Current status of microfocus X-ray sources for home-lab crystallography*

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Modern microfocus X-ray sources define the state-of-the-art for most applications in X-ray diffraction. These sources are usually combined with multilayer X-ray mirrors which are excellent X-ray optical devices for beam shaping and preserving the brightness of the source.

Microfocus rotating anode generators and liquid metal jet systems deliver flux densities in the range of  $10^{11}$  photons/s/mm<sup>2</sup>. However, these sources are expensive and need regular and sometimes time-consuming maintenance for keeping up the high photon flux. Low power microfocus sealed tube sources, such as the Incoatec Microfocus source I $\mu$ S, represent an interesting low-maintenance alternative to rotating anode generators. Power loads of several kW/mm<sup>2</sup> in anode spot sizes of < 50  $\mu$ m deliver a small and bright beam. Flux densities of up to several  $10^{10}$  photons/s/mm<sup>2</sup> can be achieved in a focused beam suitable for most protein crystals and poorly diffracting small molecule samples.

In this presentation, we will be reviewing the current performance levels of different low power microfocus X-ray sources. Further, we will be discussing the main features of the newest generation of the I $\mu$ S. We will be presenting selected results to demonstrate the impact of these modern microfocus X-ray sources on the data quality for applications in chemical and biological crystallography, such as charge density and absolute structure determination or protein screening.

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